

REMARKS

This Amendment is in response to the Final Action mailed May 21, 2003, which sets a three-month period for response. The claim amendments included herein are merely clarifying amendments and are not meant to change the intended scope of the claims. Thus, the amendments present the rejected claims in better form for consideration on appeal, and they should be entered in due course. Moreover, the amendments are manifest, requiring only a cursory review by the Examiner, thereby providing additional ground for their entry.

Claims 1-5, 12, 13 and 21-25 were pending in the application. In the Final Action, claims 5 and 24 were allowed, and claims 1-4, 12, 13, 21-23 and 25 were rejected. In this Amendment, claims 1, 2, 12, 13 and 23 have been amended, and new claims 26-28 have been added. Claims 1-4, 12, 13, 21-23 and 25-28 thus remain for consideration.

Applicants submit that claims 1-4, 12, 13, 21-23 and 25-28 are in condition for allowance and request reconsideration and withdrawal of the rejections in light of the following remarks.

§102 and 103 Rejections

Claims 23 was rejected under 35 U.S.C. §102(b) as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as being obvious over Wallace et al. (U.S. Patent No. 6,020,243).

Claims 1-3, 21 and 22 were rejected under 35 U.S.C. §103(a) as being unpatentable over Wallace in view of Mo (U.S. Patent No. 6,274,905).

Claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over Wallace in view of Mo as applied to claim 3, and further in view of Ma et al. (U.S. Patent No. 6,407,435).

Claims 12, 13 and 25 were rejected under 35 U.S.C. §103(a) as being

unpatentable over Wallace in view of Rodder (U.S. Patent No. 6,261,887) and further in view of Mo.

Applicants submit that independent claims 1, 2, 12, 13 and 23 are patentable over Wallace, Mo, Ma and Rodder.

Applicants' invention as recited in independent claims 1, 2, 12, 13 and 23 is directed toward a semiconductor device that has a gate insulating film which includes metal, silicon, oxygen, fluorine and nitrogen. Including nitrogen in the insulating film increases the film's resistance to heat and impurities. However, the presence of nitrogen also increases the occurrence of defects in the film, thereby resulting in overall degradation of the film's characteristics.

The inventors of the present invention have found that when fluorine is included in the insulating film containing nitrogen, the negative effect of the nitrogen is counteracted. Accordingly, by including both fluorine and nitrogen in the insulating film, the present invention realizes the advantages of increased heat and impurity resistance while avoiding the attendant defects. Support for including both fluorine and nitrogen in the insulating film can be found in the specification at, for example, page 12, lines 2 and 3; page 17, lines 11-18; and page 18, lines 11-18.

Neither Wallace, Mo, Ma nor Rodder discloses a gate insulating film that includes metal, silicon, oxygen, fluorine and nitrogen.

Regarding the rejections under §102 based on Wallace, it is respectfully pointed out that a two-prong inquiry must be satisfied in order for a Section 102 rejection to stand. First, the prior art reference must contain all of the elements of the claimed invention. *See Lewmar*

Marine Inc. v. Barient Inc., 3 U.S.P.Q.2d 1766 (Fed. Cir. 1987). Second, the prior art must contain an enabling disclosure. *See Chester v. Miller*, 15 U.S.P.Q.2d 1333, 1336 (Fed. Cir. 1990). A reference contains an enabling disclosure if a person of ordinary skill in the art could have combined the description of the invention in the prior art reference with his own knowledge of the art to have placed himself in possession of the invention. *See In re Donohue*, 226, U.S.P.Q. 619, 621 (Fed. Cir. 1985).

Since Wallace does not disclose a gate insulating film that includes metal, silicon, oxygen, fluorine and nitrogen, Wallace does not contain all of the elements of the claimed invention, and therefore does not anticipate the invention.

Regarding the rejections under §103, it is well-settled that there must be some prior art teaching which would have provided the necessary incentive or motivation for modifying the reference teachings. *In re Laskowski*, 12 U.S.P.Q. 2d 1397, 1399 (Fed. Cir. 1989); *In re Obukowitz*, 27 U.S.P.Q. 2d 1063 (B.P.A.I. 1993). Further, “obvious to try” is not the standard under 35 U.S.C. §103. *In re Fine*, 5 U.S.P.Q. 2d 1596, 1599 (Fed. Cir. 1988). And as stated by the Court in *In re Fritch*, 23 U.S.P.Q. 2d 1780, 1783-1784 (Fed. Cir. 1992): “The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggests the desirability of the modification.” Also, the Examiner is respectfully reminded that for the Section 103 rejection to be proper, both the suggestion of the claimed invention and the expectation of success must be founded in the prior art, and not Applicants’ disclosure. *In re Dow*, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988).

In the present case, the Examiner admits that “Wallace fails to disclose that fluorine is contained in the insulating film,” and asserts that “Mo discloses advantages for placing fluorine in a gate insulating film.” (Final Action page 4, lines 4 and 5) However, close

inspection of Mo reveals that Mo employs fluorine to segregate at an interface between bulk silicon and gate oxide to create Si-F bonds that passivates the surface of the gate oxide (see Mo col. 4, lines 54-59). Thus, while Mo appears to disclose a use for fluorine in a transistor gate, it does not teach or suggest a motive for combining fluorine with nitrogen in a gate insulating film. Indeed, nowhere in Mo is the word “nitrogen” even mention.

Since none of the cited references discloses a gate insulating film that includes metal, silicon, oxygen, fluorine and nitrogen, and none of the references teaches or suggests the desirability of such a combination, Applicants believe that claims 1, 2, 12, 13 and 23 are patentable over Wallace, Mo, Ma and Rodder – taken either alone or in combination – on at least this basis.

Claims 3, 4 and 21 depend on claim 1. Since claim 1 is believed to be patentable over the cited references, claims 3, 4 and 21 are believed to be patentable over the cited references on the basis of their dependency on claim 1.

Claim 22 depends on claim 2. Since claim 2 is believed to be patentable over the cited references, claim 22 is believed to be patentable over the cited references on the basis of its dependency on claim 2.

Claim 25 depends on claim 13. Since claim 13 is believed to be patentable over the cited references, claim 25 is believed to be patentable over the cited references on the basis of its dependency on claim 13.

New Claims

New claims 26-28 recite limitations similar to those discussed in connection with claims 1, 2, 12, 13 and 23, and are therefore believed to be patentable for at least the same

reasons as claims 1, 2, 12, 13 and 23.

Applicants submit that all of the claims now pending in the application are in condition for allowance, which action is earnestly solicited.

It is submitted that these claims, as originally presented, are patentably distinct over the prior art cited by the Examiner, and that these claims were in full compliance with the requirements of 35 U.S.C. §112. Changes to these claims, as presented herein, are not made for the purpose of patentability within the meaning of 35 U.S.C. §§101, 102, 103 or 112. Rather, these changes are made simply for clarification and to round out the scope of protection to which Applicants are entitled.

Statements appearing above with respect to the disclosures in the cited references represent the present opinions of the Applicants' undersigned attorney and, in the event that the Examiner disagrees with any such opinions, it is respectfully requested that the Examiner specifically indicate those portions of the respective reference providing the basis for a contrary view.

If any issues remain, or if the Examiner has any further suggestions, he/she is invited to call the undersigned at the telephone number provided below.

The Examiner is hereby authorized to charge any insufficient fees or credit any overpayment associated with the above-identified application to Deposit Account No. 50-0320.

The Examiner's consideration of this matter is gratefully acknowledged.

Respectfully submitted,

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